In the Claims

We claim:

Claims 1-46 (Cancelled)

Claim 47 (New): A composition of matter comprising:

a) an isolated polypeptide selected from the group consisting of:

1) an amino acid sequence comprising that selected from the group consisting of SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:14, and SEQ ID NO:16;

2) a fragment of said amino acid sequence which functions as a member of the defensin family of proteins, or having an antigenic determinant in common with a polypeptide according to 1);

3) a functional equivalent of 1) or 2);

4) an amino acid sequence consisting of that selected from the group consisting of SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:14, and SEQ ID NO:16;

5) the functional equivalent of 3), wherein the functional equivalent is homologous to the amino acid sequence selected from the group consisting of SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:14, and SEQ ID NO:16, and is a member of the defensin family of proteins;

6) the fragment of 2), wherein the fragment has greater than 80% sequence identity with an amino acid sequence selected from the group consisting of SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:14, and SEQ ID NO:16, or with an active fragment thereof;

7) the fragment of 2), wherein the fragment has greater than 90% sequence identity with an amino acid sequence selected from the group consisting of SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:14, and SEQ ID NO:16, or with an active fragment thereof;

8) the functional equivalent of 3), wherein the functional equivalent has greater than 80% sequence identity with an amino acid sequence selected from the group consisting of SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:14, and SEQ ID NO:16, or with an active fragment thereof;

9) the functional equivalent of 3), wherein the functional equivalent has greater than 90% sequence identity with an amino acid sequence selected from the group consisting of

SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:14, and SEQ ID NO:16, or with an active fragment thereof;

10) the functional equivalent of 3), wherein the functional equivalent exhibits significant structural homology with a polypeptide comprising an amino acid sequence selected from the group consisting of SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:14, and SEQ ID NO:16; and

11) the fragment of 2), wherein the fragment has an antigenic determinant in common with the polypeptide of 1), and wherein the fragment consists of 7 or more amino acid residues from an amino acid sequence selected from the group consisting of SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:14, and SEQ ID NO:16; or

b) a purified nucleic acid molecule:

1) encoding a polypeptide of any of a1) to a11); or

2) comprising the nucleic acid sequence recited in SEQ ID NO:5, SEQ ID NO:7, SEQ ID NO:13, or SEQ ID NO:15, or is a redundant equivalent or fragment of any of the foregoing; or

3) consisting of the nucleic acid sequence recited in SEQ ID NO:5, SEQ ID NO:7, SEQ ID NO:13, or SEQ ID NO:15, or is a redundant equivalent or fragment of any of the foregoing; or

4) that hybridizes under high stringency conditions with a nucleic acid molecule of any of b1) to b3); or

c) a vector comprising a nucleic acid molecule according to any one of b1) to b4); or

d) a host cell transformed with a vector or a nucleic acid molecule according to any one of b) or c); or

e) a ligand:

1) that binds specifically to the polypeptide of any of a1) to a11); or

2) which is an antibody that binds specifically to the polypeptide of any of a1) to a11); or

f) a compound:

1) that increases the level of expression or activity of a polypeptide according to any of a1) to a11); or

2) that decreases the level of expression or activity of a polypeptide according to any of a1) to a11); or

g) a compound that binds to a polypeptide according to any of a1) to a11) without inducing any of the biological effects of the polypeptide; or

h) a compound that binds to a polypeptide according to any of a1) to a11) without inducing any of the biological effects of the polypeptide, wherein the compound is a natural or modified substrate, ligand, enzyme, receptor or structural or functional mimetic; or

i) a pharmaceutical composition comprising any one of a) to h), and a pharmaceutically acceptable carrier; or

j) a vaccine composition comprising any one of a1) to a11) or b1) to b4); or

k) a kit for diagnosing disease, comprising a first container containing a nucleic acid probe that hybridizes under stringent conditions with a nucleic acid molecule of any one of b1) to b4), a second container containing primers useful for amplifying the nucleic acid molecule, and instructions for using the probe and primers for facilitating the diagnosis of disease; or

l) a kit for diagnosing disease, comprising a first container containing a nucleic acid probe that hybridizes under stringent conditions with a nucleic acid molecule of any one of b1) to b4); a second container containing primers useful for amplifying the nucleic acid molecule; a third container holding an agent for digesting unhybridized RNA; and instructions for using the probe and primers for facilitating the diagnosis of disease; or

m) a kit comprising an array of nucleic acid molecules, at least one of which is a nucleic acid molecule according to any one of b1) to b4); or

n) a kit comprising one or more antibodies that bind to a polypeptide as recited in any one of a1) to a11); and a reagent useful for the detection of a binding reaction between the one or more antibodies and the polypeptide; or

o) a transgenic or knockout non-human animal that has been transformed to express higher, lower, or absent levels of a polypeptide according to any one of a1) to a11).

Claim 48 (New): A method of using a composition of matter, comprising obtaining a composition of matter according to claim 47 and using said composition of matter in a method selected from: diagnosing a disease in a patient; treatment of a disease in a patient; monitoring the therapeutic treatment of a disease; identification of a compound that is effective in the treatment and/or diagnosis of a disease; and screening candidate compounds.

Claim 49 (New): The method of claim 48, wherein said method of using a composition of matter comprises the method for treatment of a disease, comprising administering to the patient:

a) an isolated polypeptide selected from the group consisting of:

1) an amino acid sequence comprising that selected from the group consisting of SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:14, and SEQ ID NO:16;

2) a fragment of said amino acid sequence which functions as a member of the defensin family of proteins, or having an antigenic determinant in common with a polypeptide according to 1);

3) a functional equivalent of 1) or 2);

4) an amino acid sequence consisting of that selected from the group consisting of SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:14, and SEQ ID NO:16;

5) the functional equivalent of 3), wherein the functional equivalent is homologous to the amino acid sequence selected from the group consisting of SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:14, and SEQ ID NO:16, and is a member of the defensin family of proteins;

6) the fragment of 2), wherein the fragment has greater than 80% sequence identity with an amino acid sequence selected from the group consisting of SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:14, and SEQ ID NO:16, or with an active fragment thereof;

7) the fragment of 2), wherein the fragment has greater than 90% sequence identity with an amino acid sequence selected from the group consisting of SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:14, and SEQ ID NO:16, or with an active fragment thereof;

8) the functional equivalent of 3), wherein the functional equivalent has greater than 80% sequence identity with an amino acid sequence selected from the group consisting of SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:14, and SEQ ID NO:16, or with an active fragment thereof;

9) the functional equivalent of 3), wherein the functional equivalent has greater than 90% sequence identity with an amino acid sequence selected from the group consisting of SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:14, and SEQ ID NO:16, or with an active fragment thereof;

10) the functional equivalent of 3), wherein the functional equivalent exhibits significant structural homology with a polypeptide comprising an amino acid sequence selected

from the group consisting of SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:14, and SEQ ID NO:16; and

11) the fragment of 2), wherein the fragment has an antigenic determinant in common with the polypeptide of 1), and wherein the fragment consists of 7 or more amino acid residues from an amino acid sequence selected from the group consisting of SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:14, and SEQ ID NO:16; or

b) a purified nucleic acid molecule:

1) encoding a polypeptide of any of a1) to a11); or

2) comprising the nucleic acid sequence recited in SEQ ID NO:5, SEQ ID NO:7, SEQ ID NO:13, or SEQ ID NO:15, or is a redundant equivalent or fragment of any of the foregoing; or

3) consisting of the nucleic acid sequence recited in SEQ ID NO:5, SEQ ID NO:7, SEQ ID NO:13, or SEQ ID NO:15, or is a redundant equivalent or fragment of any of the foregoing; or

4) that hybridizes under high stringency conditions with a nucleic acid molecule of any of b1) to b3); or

c) a vector comprising a nucleic acid molecule according to any one of b1) to b4); or

d) a host cell transformed with a vector or a nucleic acid molecule according to any one of b) or c); or

e) a ligand:

1) that binds specifically to the polypeptide of any of a1) to a11); or

2) which is an antibody that binds specifically to the polypeptide of any of a1) to a11); or

f) a compound:

1) that increases the level of expression or activity of a polypeptide according to any of a1) to a11); or

2) that decreases the level of expression or activity of a polypeptide according to any of a1) to a11); or

g) a compound that binds to a polypeptide according to any of a1) to a11) without inducing any of the biological effects of the polypeptide; or

h) a compound that binds to a polypeptide according to any of a1) to a11) without inducing any of the biological effects of the polypeptide, wherein the compound is a natural or modified substrate, ligand, enzyme, receptor or structural or functional mimetic; or

i) a pharmaceutical composition comprising any one of a) to h), and a pharmaceutically acceptable carrier.

Claim 50 (New): The method of claim 48, wherein said method of using a composition of matter comprises the method for treatment of a disease, and wherein the disease includes one or more of among cell proliferative disorders, including neoplasm, melanoma, lung, colorectal, breast, pancreas, head and neck and other solid tumours; myeloproliferative disorders, such as leukemia, non-Hodgkin lymphoma, leucopenia, thrombocytompenia, angiogenesis disorder, Kaposis' sarcoma; autoimmune/inflammatory disorders, including allergy, inflammatory bowel disease, arthritis, psoriasis and respiratory tract inflammation, asthma, and organ transplant rejection; cardiovascular disorders, including hypertension, oedema, angina, atherosclerosis, thrombosis, sepsis, shock, reperfusion injury, and ischemia; neurological disorders including central nervous system disease, Alzheimer's disease, brain injury, amyotrophic lateral sclerosis, and pain; developmental disorder; metabolic disorders including diabetes mellitus, osteoporosis, and obesity, AIDS and renal disease; infections including viral infection, bacterial infection, fungal infection, parasitic infection, sublethal endotoxaemia, septic shock, microbial infection of the amniotic cavity, Jarish-Herxheimer reaction of relapsing fever, infectious diseases of the central nervous system, acute pancreatitis, ulcerative colitis, empyaema, haemolytic uraemic syndrome, meningococcal disease, gastric infection, pertussis, peritonitis, psoriasis, rheumatoid arthritis, sepsis, asthma, HIV and glomerulonephritis.

Claim 51 (New): The method of claim 48, wherein said method of using a composition of matter comprises the method for treatment of a disease, and wherein the disease is one for which the expression of the natural gene or the activity of the polypeptide is lower in a diseased patient when compared to the level of expression or activity in a healthy patient, the polypeptide, nucleic acid molecule, vector, ligand, compound or composition administered to the patient is an agonist.

Claim 52 (New): The method of claim 48, wherein said method of using a composition of matter comprises the method for treatment of a disease, and wherein the disease is one for which expression of the natural gene or activity of the polypeptide is higher in a diseased patient when compared to the level of expression or activity in a healthy patient, the polypeptide, nucleic acid molecule, vector, ligand, compound or composition administered to the patient is an antagonist.

Claim 53 (New): The method of claim 48, wherein said method of using a composition of matter comprises the method for diagnosing a disease in a patient, comprising assessing the level of expression of a natural gene encoding a polypeptide of claim 47, or assessing the activity of a polypeptide of claim 47, in tissue from said patient; and comparing said level of expression or activity to a control level, wherein a level that is different to said control level is indicative of disease.

Claim 54 (New): The method of claim 53, which is carried out *in vitro*.

Claim 55 (New): The method of claim 53, comprising the steps of:

a) contacting a ligand of claim 47 with a biological sample under conditions suitable for the formation of a ligand-polypeptide complex; and

b) detecting said complex.

Claim 56 (New): The method of claim 53, comprising the steps of:

a) contacting a sample of tissue from the patient with a nucleic acid probe under stringent conditions that allow the formation of a hybrid complex between a nucleic acid molecule of claim 47 and the probe;

b) contacting a control sample with said probe under the same conditions used in step a); and

c) detecting the presence of hybrid complexes in said samples; wherein detection of levels of the hybrid complex in the patient sample that differ from levels of the hybrid complex in the control sample is indicative of disease.

Claim 57 (New): The method of claim 53, comprising the steps of:

a) contacting a sample of nucleic acid from tissue of the patient with a nucleic acid primer under stringent conditions that allow the formation of a hybrid complex between a nucleic acid molecule of claim 47 and the primer;

b) contacting a control sample with said primer under the same conditions used in step a); and

c) amplifying the sampled nucleic acid; and

d) detecting the level of amplified nucleic acid from both patient and control samples; wherein detection of levels of the amplified nucleic acid in the patient sample that differ significantly from levels of the amplified nucleic acid in the control sample is indicative of disease.

Claim 58 (New): The method of claim 53, comprising:

a) obtaining a tissue sample from a patient being tested for disease;

b) isolating a nucleic acid molecule of claim 47 from said tissue sample; and

c) diagnosing the patient for disease by detecting the presence of a mutation which is associated with disease in the nucleic acid molecule as an indication of the disease.

Claim 59 (New): The method of claim 58, further comprising amplifying the nucleic acid molecule to form an amplified product and detecting the presence or absence of a mutation in the amplified product.

Claim 60 (New): The method of claim 58, wherein the presence or absence of the mutation in the patient is detected by contacting said nucleic acid molecule with a nucleic acid probe that hybridizes to said nucleic acid molecule under stringent conditions to form a hybrid double-stranded molecule, the hybrid double-stranded molecule having an unhybridized portion of the nucleic acid probe strand at any portion corresponding to a mutation associated with disease; and detecting the presence or absence of an unhybridized portion of the probe strand as an indication of the presence or absence of a disease-associated mutation.

Claim 61 (New): The method of claim 53, wherein said disease includes one or more of among cell proliferative disorders, including neoplasm, melanoma, lung, colorectal, breast, pancreas, head and neck and other solid tumours; myeloproliferative disorders, such as leukemia,

non-Hodgkin lymphoma, leukopenia, thrombocytopenia, angiogenesis disorder, Kaposis' sarcoma; autoimmune/inflammatory disorders, including allergy, inflammatory bowel disease, arthritis, psoriasis and respiratory tract inflammation, asthma, and organ transplant rejection; cardiovascular disorders, including hypertension, oedema, angina, atherosclerosis, thrombosis, sepsis, shock, reperfusion injury, and ischemia; neurological disorders including central nervous system disease, Alzheimer's disease, brain injury, amyotrophic lateral sclerosis, and pain; developmental disorder; metabolic disorders including diabetes mellitus, osteoporosis, and obesity, AIDS and renal disease; infections including viral infection, bacterial infection, fungal infection, parasitic infection, sublethal endotoxaemia, septic shock, microbial infection of the amniotic cavity, Jarish-Herxheimer reaction of relapsing fever, infectious diseases of the central nervous system, acute pancreatitis, ulcerative colitis, empyaema, haemolytic uraemic syndrome, meningococcal disease, gastric infection, pertussis, peritonitis, psoriasis, rheumatoid arthritis, sepsis, asthma, HIV and glomerulonephritis.

Claim 62 (New): The method of claim 53, wherein said disease is a disease in which defensins are implicated.

Claim 63 (New): The method of claim 48, wherein said method of using a composition of matter comprises the method of monitoring the therapeutic treatment of a disease, comprising monitoring over a period of time the level of expression or activity of a polypeptide of claim 47, or the level of expression of a nucleic acid molecule of claim 47 in tissue from said patient, wherein altering said level of expression or activity over the period of time towards a control level is indicative of regression of said disease.

Claim 64 (New): The method of claim 48, wherein said method of using a composition of matter comprises the method for identification of a compound that is effective in the treatment and/or diagnosis of a disease, comprising contacting a polypeptide of claim 47 or a nucleic acid molecule of claim 47 with one or more compounds suspected of possessing binding affinity for said polypeptide or nucleic acid molecule, and selecting a compound that binds specifically to said nucleic acid molecule or polypeptide.

Claim 65 (New): The method of claim 48, wherein said method of using a composition of matter comprises the method for screening candidate compounds, comprising contacting a non-human transgenic animal of claim 47 with a candidate compound and determining the effect of the compound on the disease of the animal.

Claim 66 (New): An isolated polypeptide comprising an amino acid sequence selected from the group consisting of SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:14, and SEQ ID NO:16.

Claim 67 (New): The isolated polypeptide of claim 66, wherein said polypeptide consists of an amino acid sequence selected from the group consisting of SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:14, and SEQ ID NO:16.